

REMARKS

This application is a continuation application of Serial No. 10/004,918 filed December 5, 2001. The specification has been amended to correct typographical errors. This continuation application was filed to respond to the Final Rejection of November 19, 2003. The rejection was made final although the claims were rejected based upon a new reference, namely U.S. Patent No. 6,546,613 of *Donovan*. The following is responsive to the Final Rejection.

First, the Applicant would like to thank Examiner Cozart for his indication of allowability of Claims 2 and 6 if rewritten in independent form. Claim 1 has been amended to incorporate the subject matter of Claim 2 and thus should be in condition for allowance. It should be noted that Claim 1 has also been amended to correct typographical errors, wherein "concaved" has been amended to "concave" and the method step of driving the "open free end" of "said self-piercing fastener" has been amended to "said tubular barrel portion" rather than the "self-piercing element." Claim 1 has also been amended to recite that the die member includes a "die cavity in said end face including" a central die post, etc. for clarity only. Independent Claim 5 has been amended to incorporate the subject matter of Claim 6 and should also be in condition for allowance.

New Claim 18 is dependent upon Claim 1 and new Claims 19 and 20 are dependent upon Claim 5. Claims 2 and 6 have been cancelled because the subject matter of these claims have been incorporated in Claims 1 and 5, respectively.

New Claim 21 is also directed to the method of attaching a self-piercing element in a panel and includes many of the limitations of Claim 1, including recitation of the configuration of the die member, having a frustoconical side wall having an included angle of between 5 degrees and 12 degrees adjacent the end face, but further includes a

more detailed recitation of the configuration of the self-piercing element, wherein the outer surface of the radial flange portion includes “a plurality of circumferentially spaced radially outwardly projecting portions separated by concave recesses” and a method step of driving the flange portion against the second panel portion, deforming the panel portion between the frustoconical side wall and the outer surfaces of the radial projections into the concave surfaces thereby preventing rotation of the self-piercing element relative to the panel. The Applicant respectfully submits that new Claim 20 and dependent Claims 21 to 23 clearly define over the prior art cited by the Examiner.

The Applicant respectfully traverses the Examiner’s proposed combination of U.S. Patent No. 5,020,950 of *Ladouceur* and U.S. Patent No. 6,546,613 of *Donovan*. First, it is noted that *Ladouceur* is also the inventor of the invention disclosed and claimed in this application. The *Ladouceur* reference discloses a self-piercing element 20 including a tubular barrel portion 22 and a radial flange portion 29 having a plurality of circumferentially spaced pockets 40 defined in the radially extending surface 38 of the flange portion 28 which are intended to prevent rotation of the self-piercing fastener 20 relative to the panel 62. The die member 52 includes a die cavity 54 which surrounds a central die post 56. However, the configuration of the die cavity 54 shown in Figures 4, 6 and 7 is *essentially identical* to the die cavity shown in Figures 12, 13 and 14 of U.S. Patent No. 5,092,724. That is, the die cavity includes an annular lip 204 (see Figure 12 of the ‘724 patent) which drives the panel metal 218a (see Figure 14) radially into the U-shaped barrel portion 156. Contrary to the statement by the Examiner that the “Applicant has not disclosed that providing the continuous smooth frustoconical sidewall with an included angle of between 5 and 12 degrees” and joining the frustoconical side wall with the end face radiused at an angle of about the 7 degrees “provides an advantage, is used for a particular purpose, or solves a particular problem,” the specification clearly sets out

problems associated with the prior art and the important advantages provided by the die button of this invention.

The Background of the Invention sets forth several very important advantages of the disclosed configuration of the die button in the method of installation of this invention on pages 3 to 5. First, the prior methods of installation utilizing the die button disclosed in the *Ladouceur* reference and U.S. Patent No. 4,555,838 results in radial and axial deformation of the flange portion because the panel metal adjacent the pierced panel opening bottoms on the radial lip of the die button and is then driven into the U-shaped end portion formed in the free open end of the barrel. Second, the installation is very press sensitive. If the press does provide sufficient force for installation, the fastener will be loose in the panel and in an “overhit” condition, the flange portion will be deformed by cold working as described. Third, the die button has relatively poor die life and is expensive to manufacture. Fourth, the fastener and panel assembly does not have sufficient torque resistance for many applications.

The Examiner’s attention is directed to Figure 7 of the *Ladouceur* reference (U.S. Patent No. 5,020,950) which clearly shows why the die button disclosed would be totally unsuitable for attaching the self-piercing fastener element of this invention having concave recesses on an *outer surface* of the flange portion. Because the flange portion 46 bottoms against the panel portion and the U-shaped barrel portion, the outer surface of the flange portion *does not even contact the panel*. Thus, the die button disclosed in this reference would be completely unsuitable for attachment of the self-piercing fastener element of this invention.

The Examiner proposes to combine the *Donovan* reference with the *Ladouceur* reference because the *Donovan* reference discloses a die member having a continuous frustoconical outer side wall to 50. However, the die button 240 shown in Figures 10 and

11 of the *Donovan* reference is adapted to install a riveting member 26 and would be entirely unsuitable for installing the self-piercing fastener element of this invention. The Examiner states that “Donovan discloses a die member (236) including a generally frustoconical side wall (246) extending tangentially from the semicircular annular bottom surface (253) to the end face (244)” and a central die post “providing an inwardly directed force for forcing a panel portion (30) into a portion of the self-piercing element (26)” referring to column 4, lines 13 to 67. First, the riveting element 26 is not a self-piercing fastener element and, contrary to the assertion by the Examiner, the *Donovan* reference specifically states that “the deforming workpiece 30 does not substantially, if at all, abut against any portion of the sidewall 246 of the cavity 230” and “does not hinder, in any way, the deformation of the workpiece 30 as the relief pocket 253 within the cavity 238 provides for an extra area for the material of the workpiece 30 to flow during the deformation thereof.” (Column 5, lines 56 to 64). Thus, *Donovan* is directly contrary to the teaching of the *Ladouceur* reference and certainly would not teach a person of ordinary skill in this art to modify the die member disclosed in the *Ladouceur* reference, contrary to the teaching of the *Ladouceur* reference. As the Examiner is aware, the factual inquiry whether to combine references must avoid “hindsight-based obviousness” and the Examiner must apply a “rigorous application of the requirement for showing of the teaching or motivation to combine prior references.” *In Re Sang Su Lee*, 61 U.S.P.Q. 2d 1430 (Fed. Cir. 2002). There is certainly no “teaching or motivation” to combine the *Donovan* reference with the *Ladouceur* reference specifically contrary to both references.

New Claim 24 is directed to the improved die button of this invention and replaces Claim 7. Reconsideration of Claim 11 as amended and new Claim 24 directed to the improved die member of this invention is respectfully requested. First, as set forth above, it would not be obvious to combine the teaching of the *Donovan* reference with the

Ladouceur reference because the references are directed to an entirely different type of installation and the modification of the *Ladouceur* reference to include a continuous frustoconical outer side wall having an included angle of between 5 and 12 degrees would be contrary to the teaching of the *Ladouceur* reference. The method of installation disclosed in the *Ladouceur* reference (and the other references cited in the Background of the Invention) specifically require the combination of a frustoconical wall having a much greater included angle adjacent the bearing surface or end face 60, an annular radial surface driving the panel radially inwardly and an annular concave semicircular bottom wall. Without the annular radial surface, it would not be possible to install the self-piercing fastener element by the method disclosed in the *Ladouceur* patent. The method of installing a riveting element disclosed in the *Donovan* reference does not and cannot include a piercing surface on the die post. A piercing surface as defined in the claims would render the die member disclosed in the *Donovan* reference *inoperative*. As set forth above, there is clearly no motivation to combine the references *based upon the disclosures* of the references. The Examiner is resorting to hindsight based upon the teaching of this application.

The Applicant therefore respectfully objects to combining the *Donovan* and *Ladouceur* references and reconsideration of the claims directed to the die button which

results in a significantly improved self-piercing fastener element in a panel having superior die life and improved torque resistance.

Respectfully submitted,

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Dated: December 11, 2003

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I hereby certify that the enclosed **PRELIMINARY AMENDMENT** and attached documents are being deposited with the United States Postal Service as Express Mail, postage prepaid, in an envelope as "Express Mail Post Office to Addressee", Mailing Label No. **EL997489748US** and addressed to the **Mail Stop Patent Application**, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on **December 11, 2003**.



Tracy L. Smith

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